The Invention Claimed Is

1. A connector for use in connecting an end of a tubular graft conduit to a side wall of a patient's tubular body conduit via an aperture in that side wall comprising:

a medial tubular portion; and

a plurality of resilient fingers integral with the medial tubular portion and extending substantially radially out from an axial end of the medial tubular portion.

2. The connector defined in claim 1 wherein the medial tubular portion and the fingers comprise nitinol.

3. A graft assembly comprising:

a tubular graft conduit; and

a connector as defined in claim 1 substantially coaxially connected to an end portion of the tubular graft conduit.

4. The graft assembly defined in claim 3 wherein the end portion of the tubular graft conduit is disposed substantially coaxially inside the medial tubular portion.

5. A graft installing assembly comprising:

a graft assembly as defined in claim 3; and

a delivery structure disposed substantially coaxially around the graft assembly, whereby the fingers are elastically deflected inwardly

toward parallelism with a central longitudinal axis of the medial tubular portion.

6. The connector defined in claim 1 wherein the fingers include fingers that extend substantially radially out from each axial end of the medial tubular portion.

7. The connector defined in claim 1 wherein the medial tubular portion is perforated.

8. The connector defined in claim 7 wherein the perforations of the medial tubular portion increase flexibility of the medial tubular portion.

9. The connector defined in claim 7 wherein the perforations of the medial tubular portion increase radial flexibility of the medial tubular portion.

10. The connector defined in claim 7 wherein the perforations of the medial tubular portion provide sites for attachment of the connector to the tubular graft conduit.

11. The connector defined in claim 1 wherein end portions of the fingers remote from the medial tubular portion are pointed.

12. The connector defined in claim 1 wherein end portions of the fingers remote from the medial tubular portion are barbed.

13. The connector defined in claim 1 wherein the fingers are concave curved as viewed from a plane extending radially out from the medial tubular portion.

14. The connector defined in claim 1 wherein the medial tubular portion has a substantially round cross section.

15. The connector defined in claim 1 wherein the medial tubular portion has a substantially elliptical cross section.

16. The connector defined in claim 1 wherein substantially all of the fingers extending from an axial end of the medial tubular portion are of substantially similar length.

17. The connector defined in claim 1 wherein different ones of the fingers extending from an axial end of the medial tubular portion are of different lengths.

18. The connector defined in claim 6 wherein the fingers that extend from both axial ends of the medial tubular portion are of substantially similar length.

19. The connector defined in claim 6 wherein the fingers that extend from one axial end of the medial tubular portion are different in length from the fingers that extend from the other axial end of the medial tubular portion.

20. The connector defined in claim 15 wherein the elliptical cross section has a relatively large major axis and a relatively small minor axis, and wherein ones of the fingers that extend radially out more nearly parallel to the major axis than to the minor axis are longer than others of the fingers that extend radially out more nearly parallel to the minor axis than to the major axis.

21. The connector defined in claim 6 wherein free end portions of the fingers that extend from one axial end of the medial tubular portion overlap free end portions of the fingers that extend from the other axial end of the medial tubular portion.

22. The connector defined in claim 1 wherein each finger has different flexural stiffness radially of the medial tubular portion at different points along the length of the finger.

23. The connector defined in claim 1 wherein each finger has different thickness at different points along its length.

24. The connector defined in claim 1 wherein each finger has different width at different points along its length.

25. The connector defined in claim 3 wherein the fingers extend through a portion of the side wall of the tubular graft conduit.

26. The connector defined in claim 1 wherein the axial end of the medial tubular portion defines a plane which is transverse but not perpendicular to a longitudinal axis of the medial tubular portion.

27. The connector defined in claim 1 further comprising structure on free end portions of the fingers and configured to facilitate releasable retention of the fingers in a condition in which they extend substantially parallel to a longitudinal axis of the medial tubular portion.

28. The connector defined in claim 27 wherein the structure comprises an aperture through each of the fingers.

29. A graft installing assembly comprising:

a graft assembly as defined in claim 3; and

a delivery structure extending substantially coaxially through the graft assembly and including a collar configured to releasably retain the fingers in a condition in which they extend substantially parallel to a longitudinal axis of the medial tubular portion.

30. The graft installing assembly defined in claim 29 wherein the delivery structure is axially shiftable relative to the graft assembly in order to shift the collar out of engagement with the fingers and thereby release the fingers to extend substantially radially out from the medial tubular portion.

31. The graft assembly defined in claim 29 wherein the delivery structure includes a substantially conical tip extending away from the fingers and configured to facilitate entry of the graft assembly into an aperture in a patient's body tissue.

32. The connector defined in claim 1 further comprising:

an elastic web between adjacent ones of the fingers.

33. The connector defined in claim 32 wherein the web comprises silicone.

34. The connector defined in claim 1 further comprising:

a second medial tubular portion; and

a second plurality of resilient fingers integral with the second medial tubular portion and extending radially out from an axial end of the second medial tubular portion, the second medial tubular portion being configured to receive an axial end portion of the tubular graft conduit substantially coaxially inside the second medial tubular portion with the medial tubular portion received substantially coaxially inside the axial end portion.

35. The connector defined in claim 34 wherein the second medial tubular portion is further configured so that when the second medial tubular portion receives the axial end portion of the tubular graft conduit with the medial tubular portion received substantially coaxially inside the axial end portion,

the fingers on the medial tubular portion extend out of the axial end portion and the second fingers on the second medial tubular portion extend in a direction which is generally away from the fingers on the medial tubular portion.

36. The connector defined in claim 34 wherein the medial tubular portion and the second medial tubular portion include structures configured to facilitate securing those portions relative to one another.

37. The connector defined in claim 36 wherein the structures are further configured to facilitate securing the medial tubular portion and the second medial tubular portion relative to the axial end portion.

38. The connector defined in claim 36 wherein the structures comprise apertures through side walls of the medial tubular portion and the second medial tubular portion.

39. The connector defined in claim 38 wherein the apertures are configured to receive suture strands passed through those apertures and the axial end portion.

40. A plug for use in plugging an aperture through a patient's body structure comprising:

a medial tubular portion;

a plurality of resilient fingers integral with the medial tubular portion and extending

substantially radially out from an axial end of the medial tubular portion; and

a plugging structure substantially occluding the medial tubular portion.

41. The plug defined in claim 40 wherein the medial tubular portion and the fingers comprise nitinol.

42. A plug installing assembly comprising:

a plug as defined in claim 40; and

a delivery structure disposed substantially coaxially around the plug, whereby the fingers are elastically deflected inwardly toward parallelism with a central longitudinal axis of the medial tubular portion.

43. The plug defined in claim 40 wherein the fingers include fingers that extend substantially radially out from each axial end of the medial tubular portion.

44. The plug defined in claim 40 wherein end portions of the fingers remote from the medial tubular portion are pointed.

45. The plug defined in claim 40 wherein end portions of the fingers remote from the medial tubular portion are barbed.

46. The plug defined in claim 40 wherein the fingers are concave curved as viewed from a plane extending radially out from the medial tubular portion.

47. The plug defined in claim 40 wherein the medial tubular portion has a substantially round cross section.

48. The plug defined in claim 40 wherein the medial tubular portion has a substantially elliptical cross section.

49. The plug defined in claim 40 wherein substantially all of the fingers extending from an axial end of the medial tubular portion are of substantially similar length.

50. The plug defined in claim 40 wherein different ones of the fingers extending from an axial end of the medial tubular portion are of different lengths.

51. The plug defined in claim 43 wherein free end portions of the fingers that extend from one axial end of the medial tubular portion overlap free end portions of the fingers that extend from the other axial end of the medial tubular portion.

52. The plug defined in claim 40 wherein each finger has different flexural stiffness at different points along its length.

53. The plug defined in claim 40 wherein each finger has different thickness at different points along its length.

54. The plug defined in claim 40 wherein each finger has different width at different points along its length.

55. The plug defined in claim 40 further comprising structure on free end portions of the fingers and configured to facilitate releasable retention of the fingers in a condition in which they extend substantially parallel to a longitudinal axis of the medial tubular portion.

56. The plug defined in claim 55 wherein the structure on free end portions of the fingers comprises an aperture through each of the fingers.

57. The plug defined in claim 40 further comprising:

an elastic web between adjacent ones of the fingers.

58. The plug defined in claim 57 wherein the web comprises silicone.

59. The method of making a medical graft connector comprising:

providing a tube of an elastic material;

substantially axially cutting an axial end portion of the tube at a plurality of locations spaced circumferentially around the axial end portion to convert the axial end portion to a plurality of fingers that extend substantially axially from an adjacent end of an uncut medial portion of the tube;

deflecting the fingers substantially radially out from the medial portion; and

setting the fingers as deflected in the deflecting.

60. The method defined in claim 59 wherein the setting comprises:

heat treating the fingers.

61. The method of making a medical graft assembly comprising:

making a medical graft connector by the method defined in claim 59; and

substantially coaxially attaching the medical graft connector to a tubular graft conduit.

62. The method of making an assembly for installing a medical graft comprising:

making a medical graft assembly by the method defined in claim 61; and

substantially coaxially surrounding the medical graft assembly with a delivery structure which elastically deflects the fingers inwardly toward parallelism with a central longitudinal axis of the medial tubular portion.

63. The method of installing a medical graft comprising:

providing an assembly for installing a medical graft by the method defined in claim 62;

inserting the delivery structure through an aperture in a side wall of a patient's tubular body conduit; and

shifting the delivery structure relative to the medical graft assembly and the tubular body conduit so that the delivery structure is removed from the aperture but the medical graft connector is left extending through the aperture with the fingers again extending substantially radially out from the medial portion inside the tubular body conduit.

64. The method defined in claim 59 further comprising:

substantially axially cutting a second axial end portion of the tube remote from the axial end portion at a second plurality of locations spaced circumferentially around the second axial end portion to convert the second axial end portion to a second plurality of second fingers that extend substantially axially from an adjacent second end of the uncut medial portion of the tube;

deflecting the second fingers substantially radially out from the medial portion; and

setting the second fingers as deflected in the deflecting of the second fingers.

65. The method defined in claim 59 further comprising:

perforating the medial portion.

66. The method defined in claim 59 further comprising:

pointing free ends of the fingers.

67. The method defined in claim 59 further comprising:

barbing free end portions of the fingers.

68. The method defined in claim 59 wherein the deflecting comprises:

concave curving the fingers as viewed from a plane extending radially out from the medial portion.

69. The method defined in claim 59 wherein the tube is provided with a substantially round cross section.

70. The method defined in claim 59 wherein the tube is provided with a substantially elliptical cross section.

71. The method defined in claim 64 wherein the deflecting of the fingers and the deflecting of the second fingers cause free end portions of the fingers to overlap with free end portions of the second fingers.

72. The method defined in claim 59 wherein the tube is provided with different wall thickness at different locations along its length.

73. The method defined in claim 59 wherein the cutting causes each finger to have different width at different locations along its length.

74. The method defined in claim 59 wherein the tube is provided with an axial end which is

transverse but not perpendicular to a longitudinal axis of the tube.

75. The method defined in claim 59 further comprising:

providing structure on free end portions of the fingers configured to facilitate releasable retention of the fingers in a condition in which they extend substantially parallel to a longitudinal axis of the medial portion.

76. The method of making an assembly for installing a medical graft comprising:

making a medical graft assembly by the method defined in claim 61; and

placing a removable structure around the fingers to releasably retain the fingers in a condition in which they extend substantially parallel to a longitudinal axis of the medial portion.

77. The method of installing a medical graft comprising:

providing an assembly for installing a medical graft by the method defined in claim 76;

inserting the assembly for installing a medical graft part way through an aperture in a side wall of a patient's tubular body conduit so that the fingers are inside the tubular body conduit; and

removing the structure from around the fingers so that the fingers can again extend radially out from the medial portion inside the tubular body conduit.

78. The method defined in claim 59 further comprising:

providing an elastic web between adjacent ones of the fingers.

79. The method defined in claim 59 further comprising:

providing a second tube of an elastic material;

substantially axially cutting an axial end portion of the second tube at a second plurality of locations spaced circumferentially around the axial end portion of the second tube to convert that axial end portion to a second plurality of second fingers that extend substantially axially from an adjacent end of an uncut second medial portion of the second tube;

deflecting the second fingers substantially radially out from the second medial portion;

setting the second fingers as deflected in the deflecting of the second fingers; and

assembling the medial portion substantially concentrically inside an axial end section of a tubular graft conduit and the second medial portion substantially concentrically outside the axial end section.

80. The method defined in claim 79 wherein the assembling is performed so that the fingers extend out of the axial end section and so that the second fingers extend in a direction which is generally away from the fingers extending out of the axial end section.

81. The method defined in claim 79 wherein the assembling comprises:

securing the medial portion and the second medial portion relative to one another via the axial end section.

82. The method defined in claim 81 wherein the securing comprises:

suturing the medial portion and the second medial portion to one another through the axial end section.

83. The method of making a medical plug comprising:

providing a tube of an elastic material;

substantially axially cutting an axial end portion of the tube at a plurality of locations spaced circumferentially around the axial end portion to convert the axial end portion to a plurality of fingers that extend substantially axially from an adjacent end of an uncut medial portion of the tube;

deflecting the fingers substantially radially out from the medial portion;

setting the fingers as deflected in the deflecting; and

occluding the medial portion.

84. The method defined in claim 83 wherein the setting comprises:

heat treating the fingers.

85. The method of making an assembly for installing a medical plug comprising:

making a medical plug by the method defined in claim 83; and

substantially coaxially surrounding the medical plug with a delivery structure which elastically deflects the fingers inwardly toward parallelism with a central longitudinal axis of the medial portion.

86. The method of installing a medical plug comprising:

providing an assembly for installing a medical plug by the method defined in claim 85;

inserting the delivery structure through an aperture in a patient's body tissue; and

shifting the delivery structure relative to the medical plug and the body tissue so that the delivery structure is removed from the aperture but the medical plug is left extending through the aperture with the fingers extending substantially radially out from the medial portion on one side of the body tissue.

87. The method defined in claim 83 further comprising:

substantially axially cutting a second axial end portion of the tube at a second plurality of locations spaced circumferentially around the second axial end portion to convert the second axial end portion to a second plurality of second fingers that extend substantially axially from an adjacent end of the medial portion;

deflecting the second fingers substantially radially out from the medial portion; and

setting the second fingers as deflected in the deflecting of the second fingers.

88. The method of making an assembly for installing a medical plug comprising:

making a medical plug by the method defined in claim 87; and

substantially coaxially surrounding the medical plug with a delivery structure which elastically deflects the fingers and the second fingers inwardly toward parallelism with a central longitudinal axis of the medial portion.

89. The method of installing a medical plug comprising:

providing an assembly for installing a medical plug by the method defined in claim 88;

inserting the delivery structure through an aperture in a patient's body tissue; and

shifting the delivery structure relative to the medical plug and the body tissue so that the delivery structure is removed from the aperture but the medical plug is left extending through the aperture with the fingers again extending radially out from the medial portion on one side of the body tissue and the second fingers again extending radially out from the medial portion on an opposite side of the body tissue.

90. The method defined in claim 83 further comprising:

pointing free ends of the fingers.

91. The method defined in claim 83 further comprising:

barbing free end portions of the fingers.

92. The method defined in claim 83 wherein the deflecting comprises:

concave curving the fingers as viewed from a plane extending radially out from the medial portion.

93. The method defined in claim 83 wherein the tube is provided with a substantially round cross section.

94. The method defined in claim 83 wherein the tube is provided with a substantially elliptical cross section.

95. The method defined in claim 87 wherein the deflecting causes free end portions of the fingers to overlap with free end portions of the second fingers.

96. The method defined in claim 83 wherein the tube is provided with different wall thickness at different locations along its length.

97. The method defined in claim 83 wherein the cutting causes each finger to have different width at different locations along its length.

98. The method defined in claim 83 further comprising:

providing structure on free end portions of the fingers configured to facilitate releasable retention of the fingers in a condition in which they extend substantially parallel to a longitudinal axis of the medial portion.

99. The method of making an assembly for installing a medical plug comprising:

making a medical plug by the method defined in claim 83; and

placing a removable structure around the fingers to releasably retain the fingers in a condition in which they extend substantially parallel to a longitudinal axis of the medial portion.

100. The method of installing a medical plug comprising:

providing an assembly for installing a medical plug by the method defined in claim 99;

inserting the assembly for installing a medical plug part way through an aperture in a patient's body tissue so that the fingers extending from one end of the medial portion pass through the aperture; and

removing the structure from around the fingers that extend from said one end of the medial portion so that those fingers can again extend radially out from the medial portion and engage tissue around the aperture.

101. The method defined in claim 83 further comprising:

providing an elastic web between adjacent ones of the fingers.